



SCIENTISTS ARE TALKING ABOUT GLOBE . . .

Elissa Levine, NASA Goddard Space Flight Center: The comprehensive suite of GLOBE measurements that is being collected by students is critical for Earth science research -- for assessing current conditions, for monitoring changes and for driving, testing and creating models for predictions into the future. GLOBE soil data, in particular, are among the most important parameters for ecosystem modeling and interpretation of remotely sensed data. Each soil characterization measurement submitted by a GLOBE school adds to the existing soil profile data base and improves the quality of soil maps and algorithms that soil scientists can derive.

Michael Lewis, NOAA National Weather Service, Jackson, Kentucky: Schools using the GLOBE protocols provide routine and accurate data which are beneficial to the National Weather Service for verification of rainfall, snowfall and temperatures. Additionally, GLOBE meteorological data, especially rainfall, are helpful for identifying flooding potential in specific local areas. Over the longer term, numerical atmospheric modeling critical to weather forecasting demands more high quality data. GLOBE measurements such as soil composition, soil infiltration, land cover, and land utilization are important data to be integrated into the models.

Steve Running, University of Montana: The Earth's surface covers 150 million square kilometers. To understand it we need data from all over the world. The power of GLOBE is the thousands of sample points we can get from GLOBE schools every year.

David Verbyla, University of Alaska Fairbanks: There is currently no network of on-the-ground plant phenology observations to validate growing season models and estimates derived from satellite data. GLOBE schools' plant phenology observations will be the only source of wide-spread growing season observations for research to better understand climate change

Paul Schlumper, Georgia Tech: GLOBE data are crucial to our research efforts in the environmental management area. There are many instances where GLOBE data are the only data available for certain measurements or certain parts of the world.

Roger Bales, University of Arizona: GLOBE hydrology measurements fill a critical gap in water monitoring and assessment efforts in the United States and worldwide. GLOBE schools sample many smaller streams and lakes that are under-represented in the professional monitoring programs run by government agencies. We have now reached the point where GLOBE constitutes one of the largest water-quality networks in the United States and is certainly the one with the most readily available data.

Susan Postawko, University of Oklahoma: While it's true that we may have a pretty good idea of the overall temperature and precipitation patterns in many countries -- like in the United States or in parts of Europe where there are plenty of weather stations -- what we don't necessarily know is how much variation there is over a region. GLOBE student data can help us understand small-scale variations in temperature and precipitation. Student measurements of clouds, temperature, and precipitation are making a real contribution in truly understanding our day-to-day weather, as well as the long-term climate of our planet.

Bob Keane, US Forest Service, Montana: The highest cost involved in making fuel maps for fighting wildfires is in collecting the field data essential for creating accurate maps. Most natural resource agencies do not have the time, money or resources to sample fuels. The GLOBE Program provides the perfect solution with students committed to learning about fuel and fire management and ecology collecting the valuable data.

Alex Philp, University of Montana: Here at the University of Montana, Missoula, research scientists are utilizing GLOBE data for their own global models related to complex biogeochemical processes. As a necessary complement to data derived from existing and future NASA EOS satellite missions, GLOBE data are crucial for ground-truth validation of these models. Given the tremendous costs that would be normally associated with the breadth of data collection achieved by GLOBE schools around the world, scientists at the University of Montana have worked to incorporate GLOBE data into the very fabric of their research. Without the GLOBE Program, researchers could not even consider funding the necessary for ground based data collection.

David Brooks, Drexel University: There is no doubt that, when GLOBE measurements of aerosols become available, they will fill a monitoring gap that cannot be filled in any other way. Some aerosol data are currently obtained from satellite-borne instruments such as NOAA's AVHRR (Advanced Very High Resolution Radiometer) and NASA's TOMS (Total Ozone Mapping Spectrometer) and SAGE (Stratospheric Aerosols and Gas Experiment) satellites, but ground-based validation is essential to improve our ability to monitor aerosols over land as well as ocean. Continuous ground-based monitoring is also necessary to improve algorithms for assessing the impact of aerosols on climate. Currently the only global aerosol monitoring network provides less than 100 operational instruments on the ground; this does not provide adequate coverage for scientific research in areas like global transport of aerosols during events such as volcanic eruptions.

Brent Holben, NASA Goddard Space Flight Center: NASA's AERONET program collaborates with NOAA to study aerosols from a globally distributed network of

radiometers and from satellite information. There is almost no information on aerosol loading where most of the world's population resides -- in urban areas. The GLOBE Program targets those areas through school participation. It is fundamental that measurements in these areas continue and expand such that medical researchers may analyze and understand the impact of aerosols on the health of our people and children.

Joan Clemons, UCLA: Urban areas usually straddle a number of distinct microclimates. To study urban heat islands, we need to have exhaustive data from across these climate gradients. In Los Angeles this means data from within the coastal zone and inland and at elevated locations. GLOBE student data opens up more research possibilities for studying urban areas through the collection of more data and at the same time allows students to learn about the ecology of cities.

Jack Fishman, NASA Langley Research Center: GLOBE children around the world will participate in the validation of satellite measurements as new capabilities from the EOS- and Post EOS-generation of satellites initiate systematic observations of global change as we enter the new millennium. Thus, GLOBE students will be contributing to the success of these missions as scientists use their measurements as an integral component of validating what is seen from space.

Mark Schwartz, University of Wisconsin-Milwaukee: GLOBE students offer a rare opportunity to get linked plant phenology and meteorological data from a set of widely distributed sites. Such information is crucial for model validation and for establishing correspondence between satellite-derived and surface measurements of phenology. This research has important implications for global change modeling and monitoring efforts.

Jim Washburne, University of Arizona: You will not find a scientist who would not add to their observational network. GLOBE is a voluntary observational network that provides scientists critical environmental data that would otherwise not be available. GLOBE observations could be the first indication that something is amiss with limited observational programs, as was the case with the "discovery" of the Antarctic ozone hole. There is, for example, considerable bias in the current NOAA/National Weather meteorological Service Network based at low altitude airports.

Wayne Faas, National Climatic Data Center: At NCDC, we are currently comparing GLOBE student data to co-op (volunteer) and operational National Weather Service data as we hope to use the student data in climate monitoring. In order to determine the value of using GLOBE student data in climate change analyses, NCDC is computing and plotting monthly averages of temperature for both GLOBE data and co-op data and analyzing the differences. NCDC is also using GLOBE student data to validate extreme events such as flash floods, hurricanes, and tropical storms, etc. The advantage of the GLOBE student data is that it arrives in real time, whereas the co-op data comes in by mail and can take as much as a month to be received. The more GLOBE schools we have, the better.

Paul Ruscher, Florida State University: The GLOBE Program ties in directly with the NOAA and NASA missions, which involve the study of our planet and its atmosphere. As a scientist, I am concerned that the National Weather Service has virtually abandoned the taking of cloud type observations, and cannot take surface-based cloud cover observations for any cirrus, cirrocumulus, or cirrostratus clouds, since NWS ceilometers only cover clouds whose base extends down to 12,000 ft. These high clouds have been shown in climate studies to be extremely important in monitoring climate conditions, and are often harbingers of worsening weather conditions. GLOBE student observations potentially are the only reliable comprehensive sky observations available to the scientist who studies clouds and their effects.